



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,199	10/31/2003	Mark T. Holtzapple	017575.0883 (TAMUS 1603/1)	9996
5073	7590	05/18/2009	EXAMINER	
BAKER BOTTS L.L.P. 2001 ROSS AVENUE SUITE 600 DALLAS, TX 75201-2980			BEISNER, WILLIAM H	
			ART UNIT	PAPER NUMBER
			1797	
			NOTIFICATION DATE	DELIVERY MODE
			05/18/2009	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

[ptomail1@bakerbotts.com](mailto:ptomail1@bakerbotts.com)  
[glenda.orrantia@bakerbotts.com](mailto:glenda.orrantia@bakerbotts.com)

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/698,199	HOLTZAPPLE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	WILLIAM H. BEISNER	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 06 March 2009.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-43,87 and 88 is/are pending in the application.  
 4a) Of the above claim(s) 25-43 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-24,87 and 88 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____ .

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 3/6/2009 has been entered.

### ***Election/Restrictions***

2. Applicant's election without traverse of Group I, Claims 1-24, in the reply filed on 3/9/2007 is acknowledged.

3. Claims 25-43 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 3/9/2007.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-8, 11 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624).

With respect to claim 1, the reference of Marelius et al. discloses a biomass processing system that includes a water-impermeable bottom liner (2); a porous structure (4, see page 11, lines 25-30) supported by the bottom liner (2), the porous structure operable to allow flow relatively freely therethrough while preventing the passage of solids; a drain pipe (4, see page 11, lines 25-30) disposed adjacent the porous structure; a distribution pipe (11,12,13) located proximate to the porous structure; a biomass input device operable to deliver biomass over the porous structure to form a biomass pile (See the buck loader on page 6, lines 9-12); a cover (5,6) operable to allow the biomass to undergo an anaerobic fermentation; and a pump (19) operable to circulate water through the biomass by delivering water to the distribution pipe (11,12,13) and receiving water from the drain pipe after it has traveled through the biomass pile (See Figure 2).

Claim 1 differs by reciting that the system includes a lime input device operable to deliver lime to the porous structure.

The reference of Larson discloses that it is known in the art to provide the liquid distribution system in a biomass treatment system with a structure (50) for adding chemical supplements to the liquid distribution system.

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the system of the primary reference with a chemical addition system as taught by the reference of Larson for the known and expected result of controlling the pH of the liquid added to the biomass material. It is noted that the structure (50) of Larson is capable of holding and/or adding lime to the water introduced into the biomass pile.

With respect to claims 2 and 3, the system of the modified primary reference discussed above is capable of holding a lignocellulosic biomass as recited in claims 2 and 3.

With respect to claim 4, the porous structure is a gravel layer (See page 11, line 29).

With respect to claims 5 and 6, the chemical input device (50) suggested by the reference of Larson would be structurally capable of being operated in the manner recited in claims 5 and 6.

With respect to claim 7, the reference of Marelius et al. discloses reconditioning the leaching water with respect to bacteria-content (See page 6, lines 16-22) which meets the structure of an inoculum input device.

With respect to claim 8, the reference of Marelius et al. discloses the use of heat exchanger (31) to control the temperature of the water delivered to the distribution pipe.

With respect to claim 11, the reference of Marelius et al. discloses adding calcium carbonate to the water delivered to the biomass material (See page 6, line 32).

With respect to claim 87, the system of the modified primary reference is structurally capable of subjecting the biomass material to an aerobic process step.

7. Claims 9 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624) taken further in view of Hudgins et al.(US 6,024,513).

The combination of the references of Marelius et al. and Larson have been discussed above.

Claims 9 and 87 differ by reciting that the system includes an air blower and distribution pipe for delivering air to the biomass material.

The reference of Hudgins et al. discloses that it is conventional in the art to convert an anaerobic biomass treatment system into an aerobic system by using the leachate collection system as an air injection system (See column 4, lines 19-41).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the leachate collection system of the modified primary reference with an air blower for the known and expected results of alternatively allowing aerobic degradation to occur using the leachate collection system as suggested by the reference of Hudgins et al.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624) and Hudgins et al.(US 6,024,513) taken further in view of Young et al.(US 5,5935) and Lynn (US 3,973,043).

The combination of the references of Marelius et al., Larson and Hudgins et al. has been discussed above.

Claim 10 differs by reciting that the system includes a gas scrubber for contacting the air delivered to the biomass pile with lime water slurry so as to remove carbon dioxide from the air.

The reference of Young et al. discloses that it is known in the art of biomass processing to control the carbon dioxide content of the aeration gas using a carbon dioxide scrubber (See column 5, line 56, to column 6, line 10).

The reference of Lynn discloses that it is known in the scrubbing art to employ lime water to remove carbon dioxide from a gas stream (See column 6, lines 5-16).

In view of these teachings, it would have been obvious to one of ordinary skill in the art to provide the system of the modified primary reference with a carbon dioxide scrubbing device for the known and expected result of controlling the carbon dioxide content of the aeration gas. The use of a lime-slurry would have been obvious for the known and expected results of employing an art recognized means for scrubbing carbon dioxide from a gas stream.

9. Claims 12-14, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wildenauer (US 4,758,344) in view of Dibble et al.(US 4,668,388) or Norlund (US 4,952,230) and Taylor et al.(US 4,230,676) taken further in view of Furuta (JP 08-245285).

The combination of the references of Wildenauer, Dibble et al. or Norlund and Taylor et al. has been discussed above.

Claim 12 differs by reciting that the system includes a geomembrane and grid-like lattice to support the membrane.

The reference of Furuta discloses that it is known in the art of processing a biomass to employ a membrane cover (geomembrane (7)) and grid-like lattice (311) to support the membrane.

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the system of the modified primary reference with a roof structure as taught by the reference of Furuta for the known and expected result of providing an alternative means recognized in the art to achieve the same result, provide a roof for the biomass pile during processing.

With respect to the use of a plurality of distribution pipes and pumps, in the absence of a showing of criticality and/or unexpected results, it would have been obvious to one of ordinary skill in the art to provide a plurality of pipes and pumps based merely on considerations such as the size of the pile to be processed while maintaining the efficiency of the processing conditions.

Also, the reference of Wildenauer discloses the use of a conveyor belt (7) for introducing the biomass into the enclosure (1).

10. Claims 12-14, 19-21, 24 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624), Furuta (JP 08-245285) and Wildenauer (US 4,758,344).

With respect to claim 12, the reference of Marelius et al. discloses a biomass processing system that includes a water-impermeable bottom liner (2); a porous structure (4, see page 11,

lines 25-30) supported by the bottom liner (2), the porous structure operable to allow flow relatively freely therethrough while preventing the passage of solids; a drain pipe (4, see page 11, lines 25-30) disposed adjacent the porous structure; a distribution pipe (11,12,13) located proximate to the porous structure; a biomass input device operable to deliver biomass over the porous structure to form a biomass pile (See the buck loader on page 6, lines 9-12); a cover (geomembrane, 6) operable to allow the biomass to undergo an anaerobic fermentation; and a pump (19) operable to circulate water through the biomass by delivering water to the distribution pipe (11,12,13) and receiving water from the drain pipe after it has traveled through the biomass pile (See Figure 2).

Claim 12 differs by reciting that the system includes a lime input device operable to deliver lime to the porous structure.

The reference of Larson discloses that it is known in the art to provide the liquid distribution system in a biomass treatment system with a structure (50) for adding chemical supplements to the liquid distribution system.

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the system of the primary reference with a chemical addition system as taught by the reference of Larson for the known and expected result of controlling the pH of the liquid added to the biomass material. It is noted that the structure (50) of Larson is capable of holding and/or adding lime to the water introduced into the biomass pile.

Claim 12 further differs by reciting the use of a grid-like lattice structure.

The reference of Furuta discloses that it is known in the art of processing a biomass to employ a membrane cover (geomembrane (7)) and grid-like lattice (311) to support the membrane.

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the system of the modified primary reference with a roof structure as taught by the reference of Furuta for the known and expected result of providing an alternative means recognized in the art to achieve the same result, provide a roof for the biomass pile during processing.

With respect to the use of a plurality of distribution pipes and pumps, in the absence of a showing of criticality and/or unexpected results, it would have been obvious to one of ordinary skill in the art to provide a plurality of pipes and pumps based merely on considerations such as the size of the pile to be processed while maintaining the efficiency of the processing conditions.

Finally, while the reference of Marelius et al. discloses the use of bucket loaders for introducing biomass into the system, claim 12 requires the use of a conveyor belt device.

The reference of Wildenauer discloses the use of a conveyor belt (7) for introducing the biomass into the enclosure (1).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to employ a conveyor belt structure to introduce the biomass material into the system of the modified primary reference for the known and expected result of providing an alternative means recognized in the art to achieve the same result, introduce biomass material into the biomass treatment system.

With respect to claim 13, the system of the modified primary reference discussed above is capable of holding a lignocellulosic biomass as recited in claims 2 and 3.

With respect to claim 14, while the reference of Furuta is silent with respect to the structure of the support lattice, the use of I-beams is notoriously well known as a frame support member and its use in the system of the modified primary reference would have been obvious for the known and expected result of providing a well known construction element that is capable of providing a frame for supporting a roof structure.

With respect to claim 19, the lime input device suggested by the reference of Larson would be structurally capable of being operated in the manner recited in claim 19.

With respect to claim 20, the reference of Marelius et al. discloses reconditioning the leaching water with respect to bacteria-content (See page 6, lines 16-22) which meets the structure of an inoculum input device.

With respect to claim 21, the reference of Marelius et al. discloses the use of heat exchanger (31) to control the temperature of the water delivered to the distribution pipe.

With respect to claim 24, the reference of Marelius et al. discloses adding calcium carbonate to the water delivered to the biomass material (See page 6, line 32).

With respect to claim 88, the system of the modified primary reference is structurally capable of subjecting the biomass material to an aerobic process step.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624), Furuta (JP 08-245285) and Wildenauer (US 4,758,344) taken further in view of Still (DE 2057413).

The combination of the references of Marelius et al., Larson, Furuta and Wildenauer have been discussed above.

Claim 15 differs by reciting that the cover membrane includes a foam layer.

The reference of Still discloses that it is conventional in the art to insulate the enclosure for a pile of biomass that is processed (See the English language abstract).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the enclosure of the modified primary reference with an insulation layer, such as foam, for the known and expected result of ensuring that proper temperatures are maintained within the biomass processing enclosure.

12. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624), Furuta (JP 08-245285) and Wildenauer (US 4,758,344) taken further in view of Smit (EP 0 673 901).

The combination of the references of Marelius et al., Larson, Furuta and Wildenauer have been discussed above.

Claims 16-18 differ by reciting that the system includes a sugar extraction device that includes a screw conveyor and weir.

The reference of Smit discloses that it is conventional in the art of processing biomass to provide a treatment system with a screw conveyor and weir structure (3) so as to extract water from the material to be processed (See column 3, lines 22-32)

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of the modified primary reference with an

extraction device as suggested by the reference of Smit for the known and expected result of ensuring that the material to be processes is provided with the correct moisture content prior to processing the biomass material.

13. Claims 22 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624), Furuta (JP 08-245285) and Wildenauer (US 4,758,344) taken further in view of Hudgins et al.(US 6,024,513).

The combination of the references of Marelius et al., Larson, Furuta and Wildenauer have been discussed above.

Claims 22 and 88 differ by reciting that the system includes an air blower and distribution pipe for delivering air to the biomass material.

The reference of Hudgins et al. discloses that it is conventional in the art to convert an anaerobic biomass treatment system into an aerobic system by using the leachate collection system as an air injection system (See column 4, lines 19-41).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the leachate collection system of the modified primary reference with an air blower for the known and expected results of alternatively allowing aerobic degradation to occur using the leachate collection system as suggested by the reference of Hudgins et al.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marelius et al.(WO 90/15031) in view of Larson (US 3,586,624), Furuta (JP 08-245285), Wildenauer (US

4,758,344) and Hudgins et al.(US 6,024,513) taken further in view of Young et al.(US 5,5935) and Lynn (US 3,973,043).

The combination of the references of Marelius et al., Larson and Hudgins et al. has been discussed above.

Claim 23 differs by reciting that the system includes a gas scrubber for contacting the air delivered to the biomass pile with lime water slurry so as to remove carbon dioxide from the air.

The reference of Young et al. discloses that it is known in the art of biomass processing to control the carbon dioxide content of the aeration gas using a carbon dioxide scrubber (See column 5, line 56, to column 6, line 10).

The reference of Lynn discloses that it is known in the scrubbing art to employ lime water to remove carbon dioxide from a gas stream (See column 6, lines 5-16).

In view of these teachings, it would have been obvious to one of ordinary skill in the art to provide the system of the modified primary reference with a carbon dioxide scrubbing device for the known and expected result of controlling the carbon dioxide content of the aeration gas. The use of a lime-slurry would have been obvious for the known and expected results of employing an art recognized means for scrubbing carbon dioxide from a gas stream.

### ***Response to Arguments***

15. Applicant's arguments filed 3/6/2009 (See Remarks) with respect to claims 1 and 12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM H. BEISNER whose telephone number is (571)272-1269. The examiner can normally be reached on Tues. to Fri. and alt. Mon. from 6:15am to 3:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/William H. Beisner/  
Primary Examiner  
Art Unit 1797**

WHB